Tips for Fountains – this is dated – to be updated soon …

by Deborah R. Fowler

Disclaimer: These are guidelines – “rules of thumb”, and ultimately like many things in Houdini there may be several right answers and often “it all depends”.

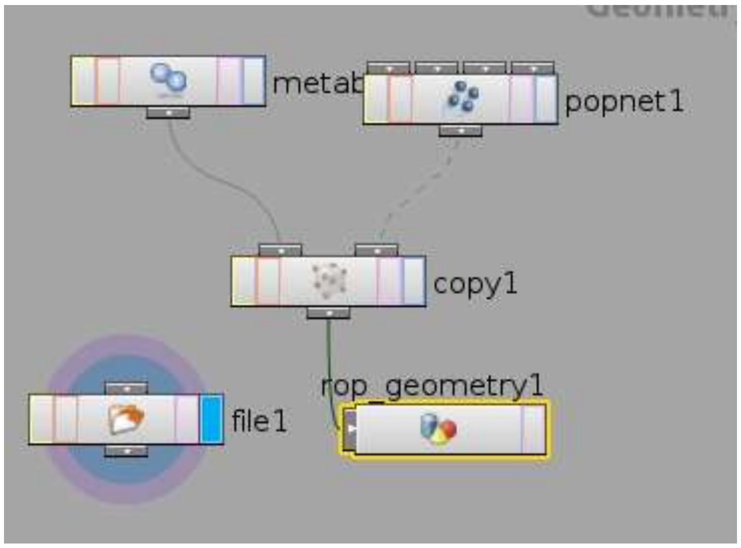
Clumping Prevention:

- Try an **emitter** that has some shape to it, such as a hemisphere rather than a flat disc
- Try using **oversampling** – “the oversampling value determines how many times the network cooks in between frames”
- A reminder, when manipulating your particles, if you are using $F (current frame) - don’t – use $FF (sub frame or fractional frame number)
- Can also try manipulating the velocity vector itself, but I would recommend this last
- Accurate births – are only applicable when the source geometry is animated. If this is not the case, leave this option off, it will not help clumping.

Caching:

- For rendering this is a big win, it can also be a big win for previewing your simulation since you don’t have to wait for the display to update.

One easy was to do this is to set up a render rop in your simulation and “render” your files, then read in the files using a file node – this speeds up the feedback loop.



The file node as well as a cache node (not pictured here) can be used for the purpose of “pre-cooking” data. The top configuration is my preference – feel free to use the nodes that work best for you.

PBR:

use it if you are rendering fluids – it is good for reflections/refractions, area lights, env lights – see the document on the Houdini Resources page talking about Tips for Complex Scenes.

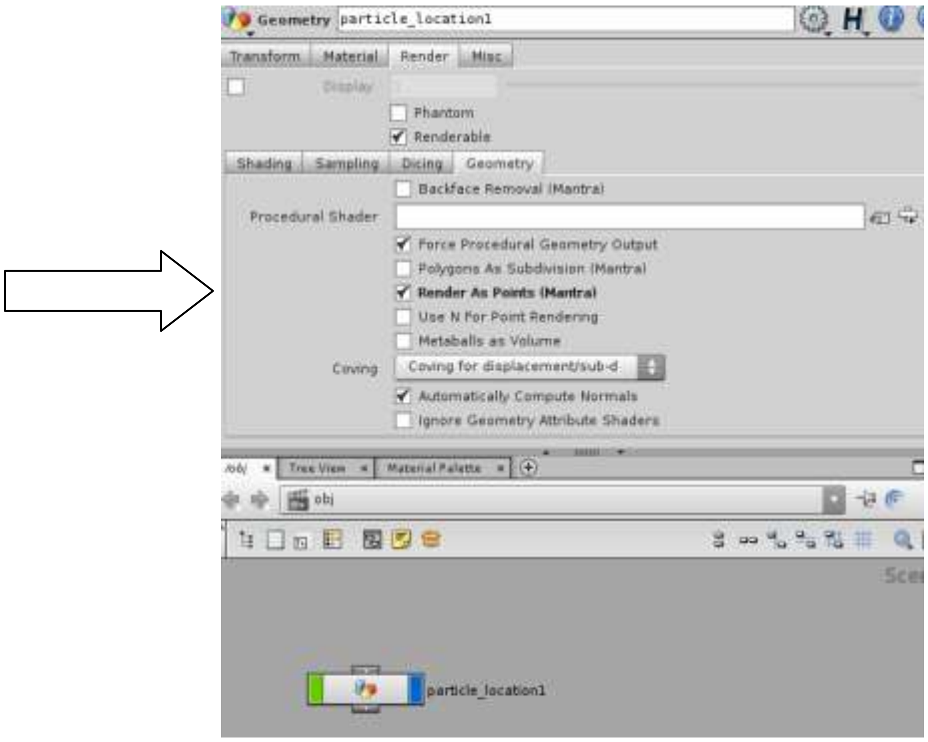
Note: if you are rendering smoke, or something requiring sprites, rendering particles as points, you will likely win by using the Micropolygon renderer.

Shaders – Basic liquid works well in most cases – just ensure you have an environment – if you see black parts in your liquid it is likely the reflection.

Geometry:

There are many ways to render particles. For fountains the most successful are **metaballs** or **points**. You can also use the particlefluidsurface.

Points – in the particle sop you will see under the Render/Geometry tab several check boxes. Select Render As Points (Mantra) – this effectively renders as disks. A sample hip file exists on the Houdini Resources page.



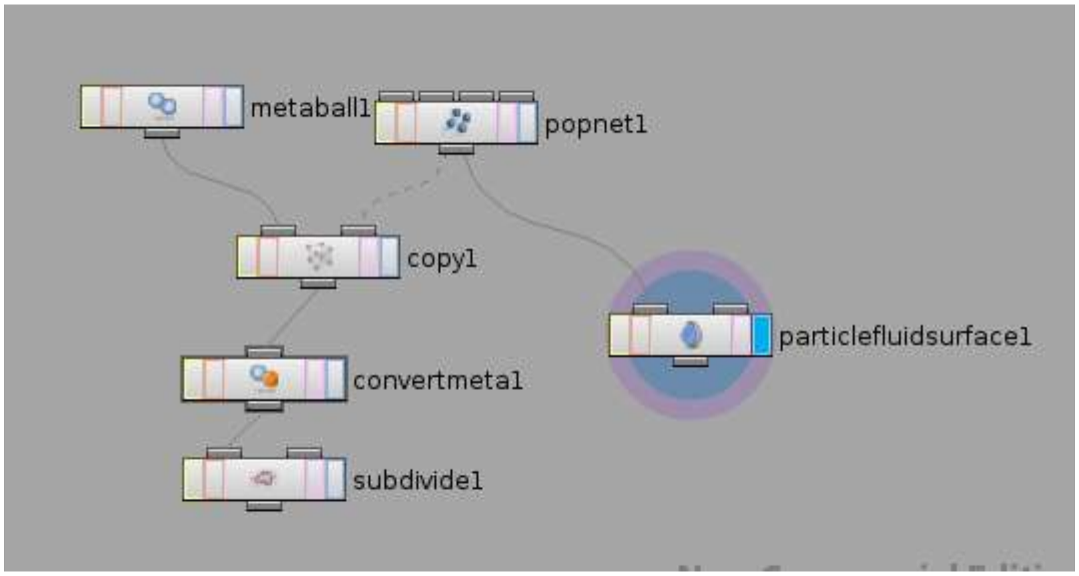
Geometry particle_location1

[ ] Phantom
[✓] Renderable

[ ] Backface Removal (Mantra)
Procedural Shader
[✓] Force Procedural Geometry Output
[ ] Polygons As Subdivision (Mantra)
[✓] Render As Points (Mantra)
[ ] Use N For Point Rendering
[ ] Metaballs as Volume
Coving: Coving for displacement/sub-d
[✓] Automatically Compute Normals
[ ] Ignore Geometry Attribute Shaders

particle_location1

Metaballs – you may find it beneficial to convert your meta balls to lessen the geometry. You can use the Convert Meta node. This converts the surface of a metaball into polygons. (The next diagram shows the metaball or particle fluid surface option.)



Why? Because metaball surfaces are implicit, they must be converted into explicit surfaces before rendering. It will automatically convert into polygons at render time – thus this allows us to control how much polygon resolution is needed for our specific purpose.

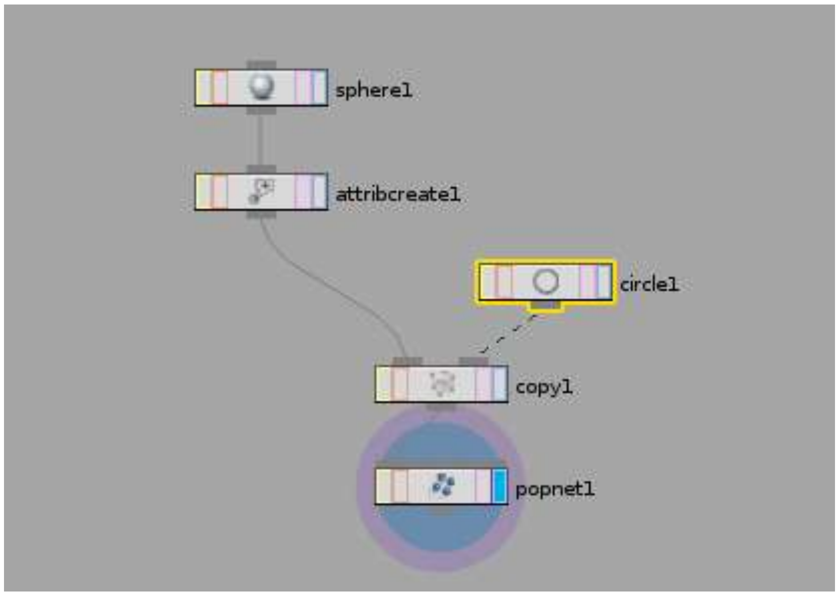
Metaballs react in a way similar to drops of water, thus making them an excellent choice.

Particle Fluid Surface – generates a polygonal surface around the particles from a particle fluid simulation. Any set of points may be used as an input to this SOP provided the "pscale" is defined in the input.

Your choice will depend on your desired look. (See www.gettyimages.com and type in fountains – on the first page you'll see excellent footage of up close/distant fountains, and time of day).

Multiple Fountains (Sprays):

As you move into Project 1, you will be using multiple sources, here is a screen snap from the **particleCopypop.hip** that is in the dropbox (courtesy of Matt F.). Here the velocity is created as an attribute and varied using copy stamping to be feed into the particle source.



Trouble-shooting:

If you are seeing black artifacts – check your shadows/lighting, make sure you have an environment to refect, check your refract/reflect limits (default is 10 – should suffice but not in all cases – the lower number, the faster renders). You can also turn this down to speed up test render times and run it back up for final render – but caution – test it at the level you need to anticipate render issues.